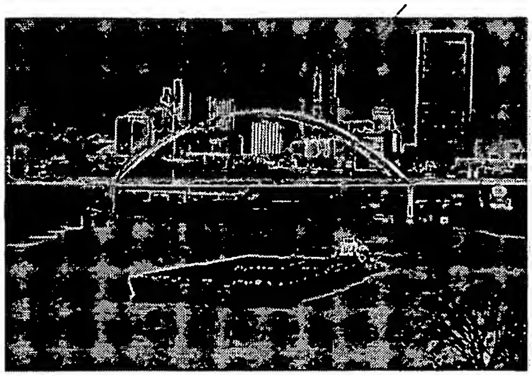
BOW SHAPE



Barge on River in Pittsburgh Photograph
To Order, reference Picture Number Barge 4 (Barge on River)
Click here to return to Gallery Page

Certified Coatings Barge Listing

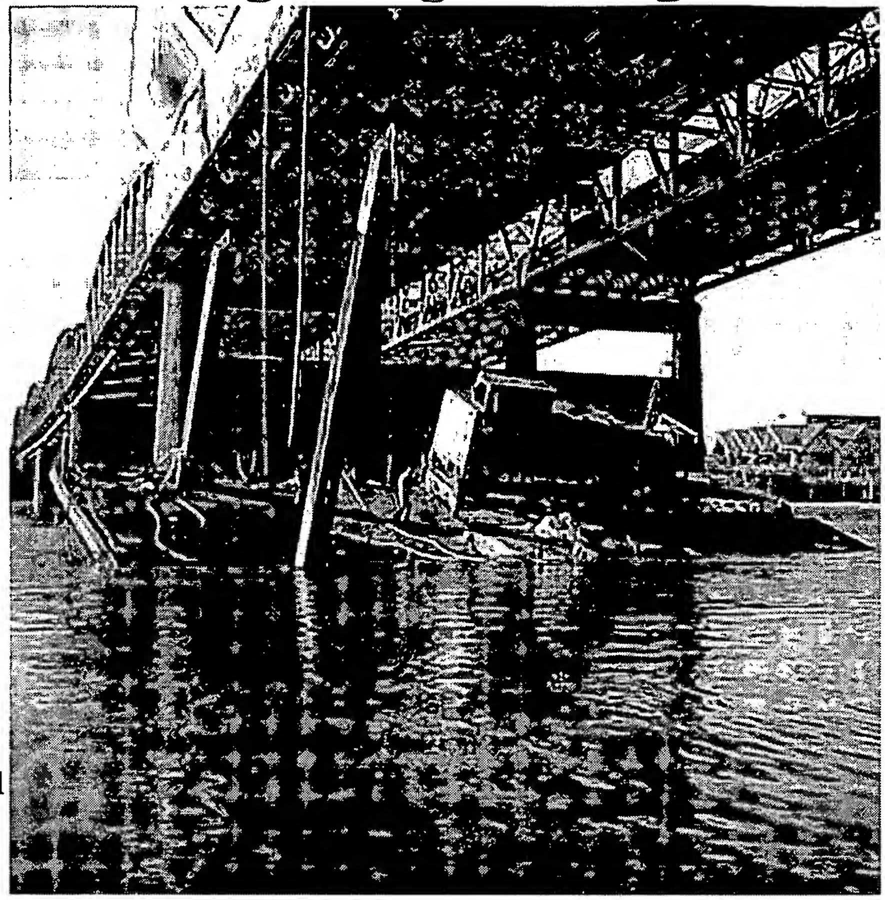
Summary Information

Date of Incident:
Friday, October 6, 2000, 2:45 p.m.

Location:
Under the Portland I-5 bridge, on the "Oregon side" of the Columbia River (refer to map)

Product/Quantity:
Initial report: forty-six, 55 gallon drums of spent sandblast material (steel grit which contains lead based paint chips). A 5,000 gallon capacity fuel tank with about 2,000 gallons of diesel fuel, and several pieces of equipment with associated fuel tanks.

Cause:
Under investigation.



Photograph of the Ross Island Spud Barge under the Portland Interstate 5 bridge, on the Columbia River. The listing barge is being held up by the "spuds" (the post with yellow tips, which are used to stabilize the barge under normal working conditions). At the barge listed equipment and spent sandblast grit were dumped into the river.
Taken by: Eric Heinitz, Ecology 10/08/00

Ecology is no longer active at this incident.

Photographs

- 10/08 Photos from the site

News Articles

- Oct. 18 **Barge-Spill Cleanup Nearing Completion** The Columbian

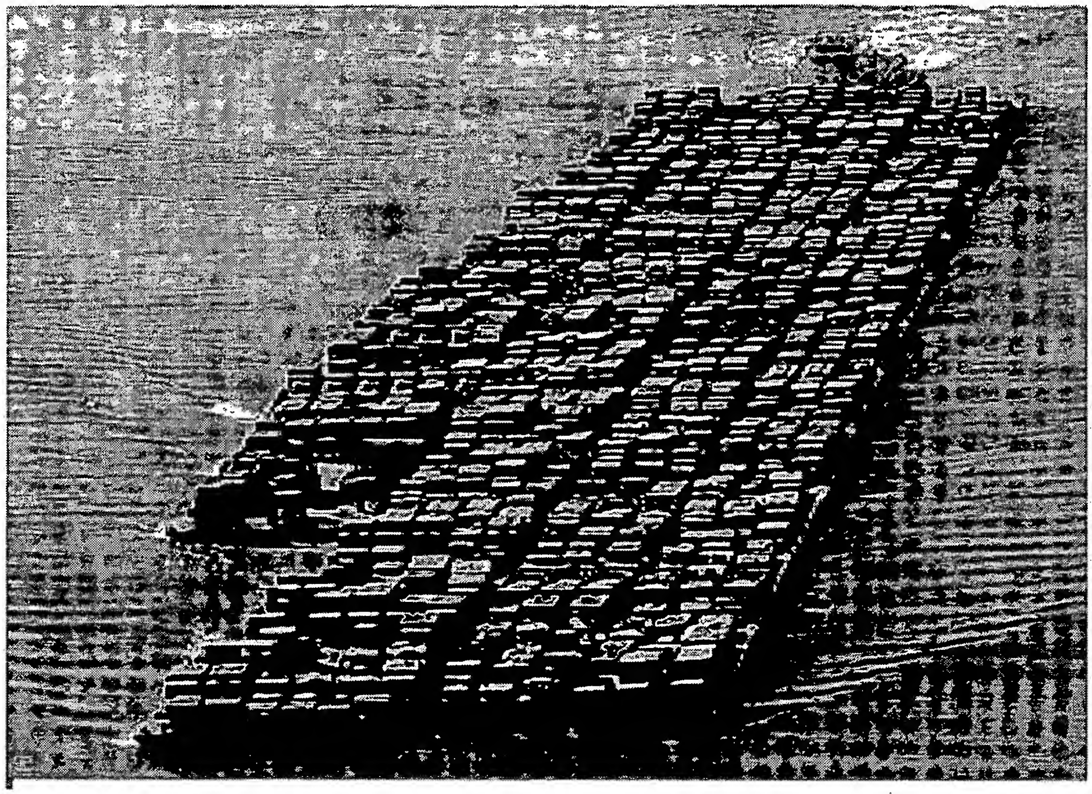
Up Date, Wednesday, 10/10/00

Clean-up efforts continue to focus on the recovery of the 55- gallon drums of spent sand blast grit. On Monday six drums were recovered, fortunately all of them were intact. It is hoped that the remaining 42 drums are also intact. But there is the possible that some of the drums which slid over-board were not sealed. It is also possible that some of the remaining drums, even if sealed, were damaged by the heavy equipment which also slid over-board.

The drum recovery effort is expected to be completed by the end of the week. While the recovery of the equipment which also slid over-board will take longer. Fortunately, the 5,000 gallon fuel tank, which was recovered appears to have suffered only minor damage. The

National Considerations

The government's maritime intermodal efforts should encompass all regions that face potentially severe congestion on the land modes and have the physical attributes to establish ameliorative short sea shipping and/or container-on-barge services. Specifically, cooperative efforts for short sea operations among all coasts and for COB operations on the whole Mississippi system should be encouraged. The GRIP region can contribute to and benefit from any national maritime intermodal effort. Some other regions may face more serious congestion now or in the near future, but the GRIP states have collectively more maritime assets than any other region. A broad multi- regional approach would energize the economies of scale and would best utilize GRIP regional expertise in national planning.



Photograph Courtesy of Osprey Line
A MOVEMENT OF MILITARY ROLLING EQUIPMENT

(*Link no longer available*)

- Oct. 10
  Intact Barrels Removed From River
  The Columbian
  (*Link no longer available*)
- Oct 7
  Barge spills heavy load. Seattle PI

Maps/Drawings

- General Location, USGS TOPO

barge was removed from the area on Sunday.

The cause for the listing of the barge is still under investigation by the Coast Guard and the Oregon State Police.

Background Information

At about 2:45 pm on Friday, Oct. 6, 2000; a barge used as a platform to assist workers painting the I-5 bridge near Portland started taking on water and eventually tipped to one side.

The tipping of the barge resulted in the following being dumped into the Columbia River: forty-eight 55 gallon barrels with spent sandblast grit (steel grit with lead based paint chips), a 5,000 gallon capacity fuel tank with about 2,000 gallons of diesel fuel, and a variety of heavy equipment with associated fuel tanks.

Boom lines were placed downstream to contain any fuel releases. The booms are being monitored 24 hours a day. Adsorbent materials have been placed within the boomed area to contain as much spilled material as possible.

The barge was stabilized, and an initial diving assessment was made. The 5,000 gallon capacity fuel tank was recovered, and salvage options for the other material is being developed.

Ecology Home | Spills Home | Search

Last updated 03/24/2005 Email: Webmaster

Jim Michalak's Boat Designs

118 E Randall, Lebanon, IL 62254

A page of boat designs and essays.

(15Mar99) This is going to be a bit interesting because this issue will be devoted to two subjects I know almost nothing about. First subject will the the prismatic coefficient and the second will be the presentation of a proa design. Next issue, 1Apr99, will show ways to figure the displacement of a design.

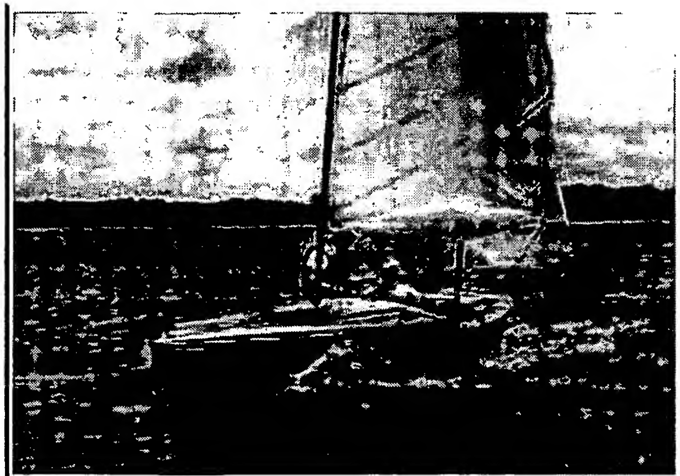
NEAT WEB SITE...

Jim Huxford has a great site at www.apci.net/~jhuxford devoted to his heart throb, Sparkman and Stevens boats. Here is how I met Jim. We were both poking around a marina at Carlyle Lake over the Christmas holidays about 10 years ago. Things were frozen hard at the time so it took true boat nuts to be about. He started talking about his Bolger sharpie. I couldn't believe it! Turns out he lives a half mile from here - I still can't believe it! Taught me about computers too. The photo below shows his Otter about 10 years ago at our first Midwest Messabout. It was probably the fastest sailboat we ever had at our messabouts.

TEXAS MESSABOUT...

Tim Webber is once again hosting a messabout in the Houston area on April 16, 17, and 18. For details contact Tim at tbertw@sccsi.com.

	Left: JIM HUXFORD'S BOLGER OTTER



Contents:

Contact info:

michalak@apci.net

Jim Michalak
118 E Randall,
Lebanon, IL 62254

Send $1 for info on 20 boats.

PRISMATIC COEFFICIENT

HISTORY...

Ship design got serious and scientific over 100 years ago when men like Froude started studying the elements of hull resistance through the water. Ships then were strictly "displacement" boats, with no "planing" involved. Resistance was broken into four main catagories. 1) Wave-making. 2) Frictional. 3) Pressure or Form. 4) Air resistance. I'll only discuss 1 and 3 now. Frictional resistance is from the water rubbing past the skin. Air resistance is of the wind against the above water boat.

Waves come mostly from the bow and again from the stern and from any abrupt changes in the hull along its length. All the waves combine in one way or another to make humps and hollows in a resistance curve as the various waves reinforce and cancel each other. Attempts

to hang pedictable numbers on the event lead to the "Froude Number". Usually we see the calculation of the Froude Number more in the form of the "speed-length ratio" which is equal to speed (in knots) divided by the square root of the waterline length (in feet). Usually a reasonable maximum speed-length ratio of 1 would be expected from a normal displacement hull although it can be a bit higher. Thus a hull with a 16' waterline length might peak at about 4 knots. A 25' waterline hull would peak at about 5 knots, etc.. The longer the waterline the faster the boat.

It's just a rule of thumb with lots of exceptions. Those of us who row a lot know that there is a lot more involved. For one thing the above rule of thumb makes no allowance for hull shape. For example a fine 16' rowboat will row two or three time faster than a 16' jonboat designed for a gasoline engine.

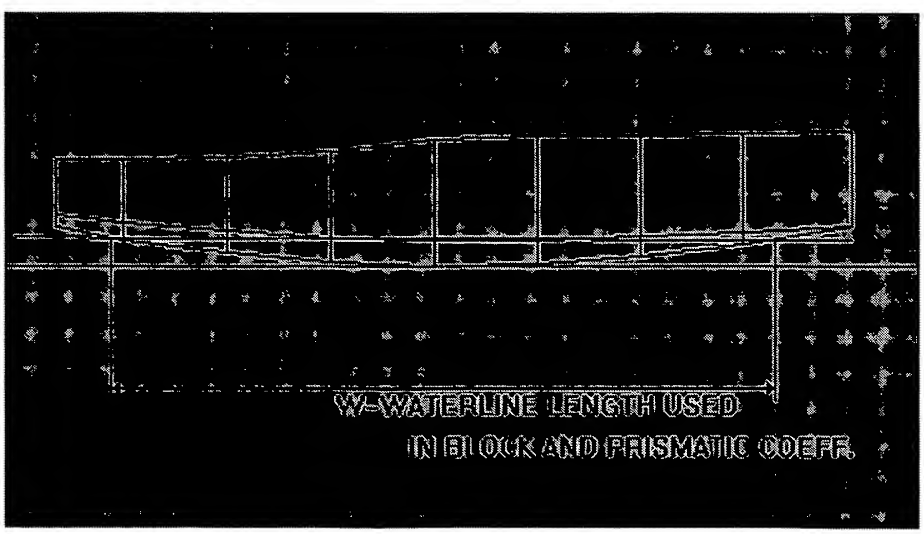
The Pressure or Form resistance effect is supposed to allow for some of those other factors that separate the faster ones from the slow ones. The form of the hull affects the turbulence and eddying of the hull as the water moves aft.

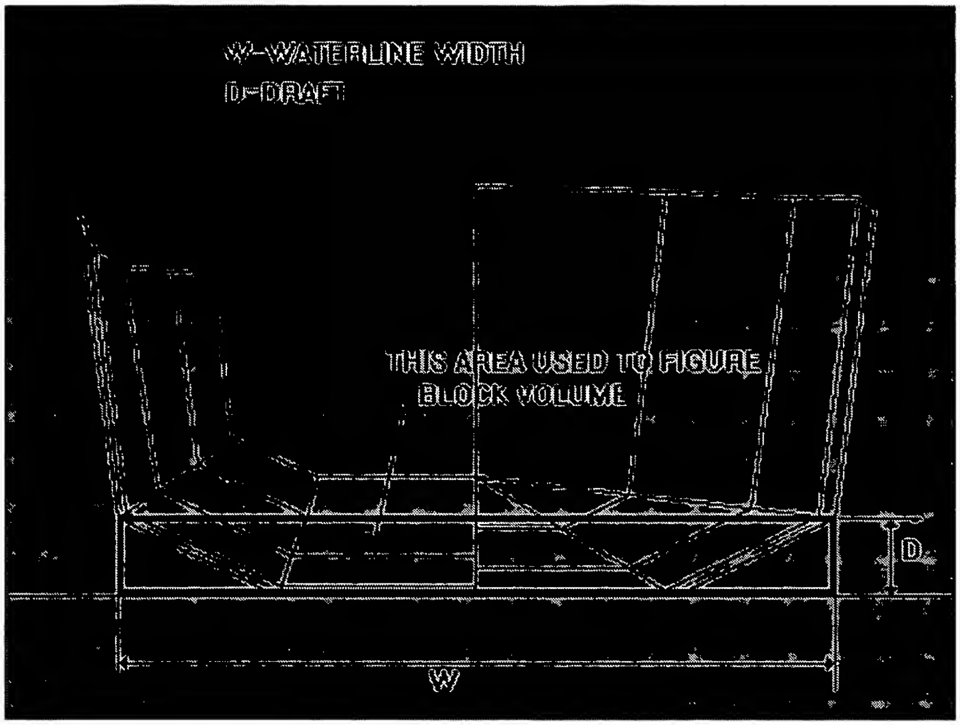
The wave-making and form resistance elements are often joined together into the "residual resistance".

The idea behind all this was to design a ship, make a small model of the hull and test it in a tank, measuring drag. This to be done at the same speed-length ratio as intended for the full ship, so the model has the same wave pattern as the full sized ship. The frictional drag element of the model can be calculated and subtracted from the whole. Eventually the entire business can be scaled up to the full sized ship and performance or powering requirements determined from the small model tests. That was the whole idea behind the head scratching.

BLOCK COEFFICIENT...

As I said before, some shapes are faster than others. For big ships, where the studies originated, it was found that a rough measure of shape could be the "block coefficient". Figures 1 and 2 show the idea behind the block coefficient.





Here is how it's done. Let's say your boat has a waterline length of L, a maximum waterline beam of W and draft of D. Then you might imagine it fitting neatly into a rectangular block with length L, waterline width W and depth D. That block will have a volume of LxWxD. The block coefficient is calculated by dividing the actual volume of your below-the-water hull by the volume of the imaginary rectangular block.

So there are two parts to the puzzle here. The underwater hull volume is determined by the weight of the boat. Once you've defined the underwater hull the L,W, and D, you need to measure the block are easily found.

First you need to know the total weight of your boat and everything in it..Not always an easy number to come by.

The boat's total weight is equal to the amount of water it "displaces" or pushes aside. Fresh water weighs about 62 pounds per cubic foot and salt water at maybe 64 pounds per cubic foot. So if your boat's total weight were 620 pounds it would push aside, "displace", about 10 cubic feet of fresh water.

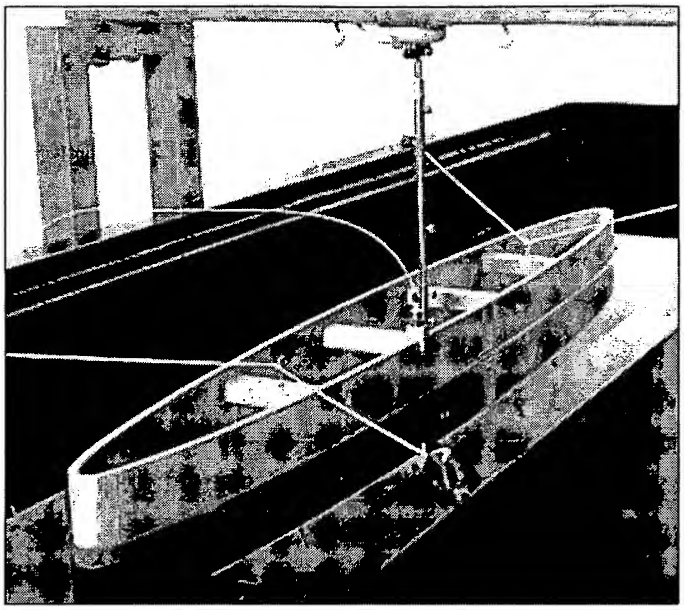
Next you must push your imaginary design down into the imaginary water until the volume of hull under the waterline equals the volume of water to be displaced at the given weight. This is usually a trial and error calculation that will be explained next issue. Once you find a suitable draft to balance your weight, you measure the waterline length and maximum waterline beam at that draft. Those are the L, W, and D used to size the "block" of the block coefficient. Multiply L times W times D to get the volume of the imaginary "block"

Lastly, you divide the actual displacement by the volume of that imaginary block. That is the Block Coeffiecient.

A hull like a barge which is totally squared off will have a block coefficient of 1, the

maximum you could have. If you refined the ends of that square barge and make them pointy and smooth and round you reduce the block coefficient for the design maybe down to .5 and it would go through the water with a lot less waves than the totally rectangular boat, even though it's main cross section is still rectangular.

SHIPS VIBRATIONS TEST MODEL
SHIPS STABILITY APPARATUS



NA4 & NA8
issue 5

*The **NA4-10 Ships Vibrations Test Model** apparatus is designed to enable students to investigate a simple model hull form for resonance phenomena. It may be used in conjunction with the optional fresh water tank or any suitable tank which may be available. Many of the principal phenomena associated with ship resonant vibration are clearly demonstrated.*
At a more advanced level the distribution of mass and second moment of area may be calculated and using a Young's Modulus value for the material of the ship shaped beam, the natural frequencies may be estimated by a simple tabular method or other means and compared with the measured value.

DEMONSTRATION CAPABILITIES

In air to:

- *Investigate modal characteristics of a simple suspended ship shaped box girder*
- *Produce a resonance curve*
- *Produce the amplitude curve of a 2-node and 3-node flexural model*
- *Illustrate the influence of mass and its distribution upon natural flexural frequencies*

In water to:

- *Measure the influence of added virtual mass on natural frequency*
- *Illustrate the effect of the addition and distribution of sand ballast on the natural frequency*
- *Calculate the added virtual mass by different methods and compare with experimentally measured influence using a Schlick-type formula*

ORDERING SPECIFICATION

- ***Apparatus designed to enable students to investigate a simple model hull form for resonance phenomena.***
- ***The apparatus comprises an experimental model hull, a rigid supporting frame, a vibrator (complete with signal generator and power amplifier) and an optional Flotation Tank (order code NA4-11).***
- ***The experimental model is flat bottomed, wall-sided and open topped. It has an elliptical plan form.***
  - ***Length to Beam ratio 8:1***
  - ***Length to Depth ratio 12:1***
- ***Used to demonstrate the principle phenomena associated with ship resonant vibration.***
- ***Can be used to investigate resonance phenomena in both air and water.***

OPTIONAL ACCESSORY

NA4-11 Flotation Tank for NA4-10

SERVICES REQUIRED

Electrical supply:
NA4-10-A: 220V-240V/1PH/50HZ
NA4-10-B: 120V/1PH/60HZ
Free water surface, if NA4-11 Fresh Water Tank not ordered

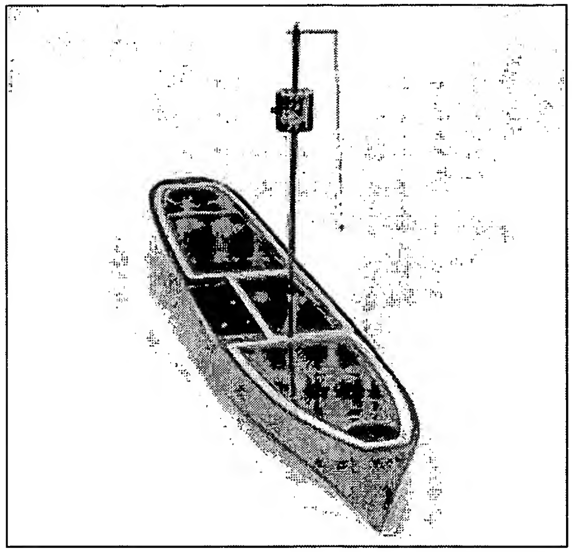
OVERALL DIMENSIONS

NA4-10 only:
Height: 1.44m
Width: 2.66m
Depth: 1.17m

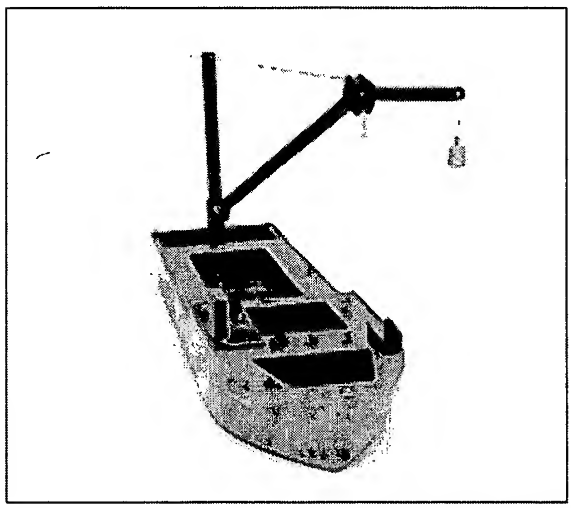
SHIPPING SPECIFICATION

NA4-10 only:
Volume: 1.0m³
Gross weight: 75Kg

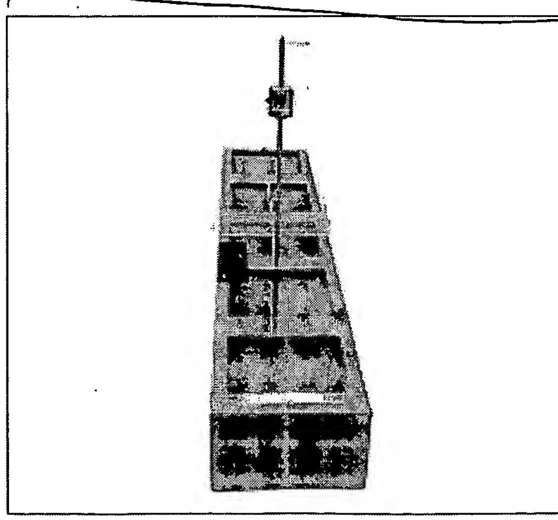
Optional Ship Models for NA8-10
see details on back page



NA8-14 Trawler Model



NA8-15 Crane Ship Model



NA8-16 Rectangular Barge Model

*The **NA8-10 Ships Stability Apparatus** is designed for the study of ship hydrostatics and stability. A comprehensive manual provides hydrostatic stability and other data for ship models and includes a number of experiments which are useful to students. Exercises are conducted on a 1/70 scale model of a general cargo vessel of 28000 tonnes ship mass. Rolling, righting and the effects of flooding various compartments may be studied. Optional alternative ships models are also available for study.*

DEMONSTRATION CAPABILITIES

- *Inclining experiment*
- *Influence of a free surface*
- *Influence of a suspended mass, (with the optional crane ship model)*
- *Effect of flooding various compartments*
- *Rolling experiments*

ORDERING SPECIFICATION

- ***Apparatus designed to enable students to study ship hydrostatics and stability.***
- ***Supply includes a water tank, a floating ship model, a dynamometer and a clinometer.***
- ***The model supplied is a 1/70 scale model of a 28000 tonne general cargo vessel.***
  - ***It includes a number of transverse watertight bulkheads in representation positions.***
  - ***The compartments are fitted with individual flooding valves.***
  - ***The model is constructed of glass reinforced plastic (GRP).***
  - ***Models of other ships are available as optional accessories.***
- ***The dynamometer measures the righting moment of the model.***
  - ***It holds the model at any angle of heel within the range, with the model either free to trim or with heeling axis kept horizontal.***
  - ***It exerts no vertical force on the model.***
  - ***It is floor standing, with castors and is supplied complete with counterweights.***
- ***Battery powered clinometer measures the inclination of the model, over the range of 0 to 45 degrees.***

Armfield Limited
Bridge House, West Street, Ringwood,
Hampshire BH24 1DY, England
Tel: +44 (0)1425 478781 Fax: +44 (0)1425 470916
E mail: sales@armfield.co.uk
URL: http://www.armfield.co.uk

USA Office:
Armfield Inc.
436 West Commodore Blvd (#2)
Jackson NJ 08527
Tel: (732) 928-3332 Fax: (732) 928-3542
E mail: armfield@optonline.net

OPTIONAL ACCESSORIES

NA8-14 Trawler Model:
A 1/25 scale model of an ocean going trawler of 850 tonnes ship mass constructed in glass reinforced plastic (GRP). The hull is fitted with a number of transverse watertight bulkheads in their correct positions. Flooding valves are fitted.

NA8-15 Crane Ship Model:
A 1/50 scale model of a crane ship typical of those used in off-shore industries. The hull is ballasted and fitted with a moveable derrick supplied with a number of masses for suspension.

NA8-16 Rectangular Barge Model:
Moulded in GRP, dimensions 2200 x400 x 250mm and fitted with internal bulkheads, supplied with the necessary ballast and trimming weights.

OVERALL DIMENSIONS

NA8-10 only:

Height:	*2.17m*
Width:	*2.66m*
Depth:	*1.95m*

SHIPPING SPECIFICATION

NA8-10 only:

Volume:	*3.0m³*
Gross weight:	*550Kg*

Specifications may change without notice.
iss5/5k/1203/RG.